(U) Annex L to Volume 2
CID Borealis 02 Final Report

CONCEPT PAPER 12 JULY 2001

BACKGROUND

1. The focus of national military strategy has shifted from an emphasis on a single global threat to a fast-paced, rapidly changing environment that is driven by crisis situations. Responses to these situations have increasingly taken on a multi-national character and are often bringing together national warfighting capabilities that have not in the past worked extensively together. The interoperability of Communications and Information Systems (CIS) within and between multi-national formations, such as those formed by ABCA (NZ) nations has, therefore, become increasingly important and complex.

2. The ABCA (NZ) Program began in 1947 when General Eisenhower and Field Marshall Montgomery agreed that the levels of co-operation and standardisation achieved during World War II should be maintained and extended. America Britain and Canada were the original members and Australia joined them in 1963. New Zealand became an associate member through Australia in 1965. The ABCA (NZ) strategy is to ensure that Armies achieve the agreed levels of standardisation necessary for two or more ABCA Armies to operate effectively within a coalition.

3. To facilitate achievement of this strategy ABCA (NZ) nations participate in a variety of workshops, conferences, exercises and demonstrations. CID BOREALIS 2002 is one such demonstration that focuses on CIS interoperability. While previous CIS activities have been held CID BOREALIS 2002 will be the first activity to deploy troops and material with a view to assess interoperability as a characteristic of ABCA (NZ) tactical CIS. It is intended to conduct tactical interoperability activities on a regular basis.

AIM

4. The aim of CID BOREALIS is to test CIS interoperability among the participants in order to prepare and enable those nations to operate together in support of coalition tactical operations.

SCOPE

5. The scope of interest for testing includes achieving, confirming and documenting tactical interoperability as a quality of current national CIS. This includes the network domain level, end-to-end user capabilities of land-based CIS systems and the user domain associated with C2 and EW applications. The Demonstration will enrich participating nations with the necessary knowledge to efficiently transfer data and voice based information between various tactical CIS equipment and personnel using their own equipment. Annex A provides additional insight into the scope of testing. All functional areas will apply agreed security procedures, where applicable and possible, to the overall CID BOREALIS 2002 process.

OBJECTIVES

6. CID BOREALIS overall objectives are the following:

a. Planning . To identify planning, operational, technical and support procedures to achieve CIS interoperability. The planning process will expose participants to a deliberate planning activity. The main result of planning will be a coalition tactical network consisting of switches, routers, cable, and radio subsystems that will be subjected to a testing regime. The planning process produces four main deliverables; the architecture for the coalition tactical network and its subnetworks, the test plan, the analysis plan and the support plan. Planning will provide a forum to exchange CIS information and to maintain verified data of the technical characteristics of each participating country's CIS equipment. It will familiarise participants from the ABCA and NZ armies with each other, with their Command and Control Structures and with their individual national perspectives.

b. Coalition Tactical Network;

(1) To establish and test a voice and data network that will confirm distinct C and IS interoperability; and

(2) To establish the capability of data and voice networks via various means (including a variety of transmission systems and network configurations)

- Establishment of the coalition tactical network will be through as series of stages starting first with technology-centric workshops focusing on subnetworks. The subnetworks are then combined and integrated to form the coalition tactical network configuration of switches and routers that has been deemed feasible by prior planning.

c. Testing

(1) To confirm communications connectivity and CIS interoperability

(2) To test the capability of data and voice networks via various means;

(3) To test the stability of communications connectivity.

- The testing objectives will be achieved through a testing and documentation process in a collaborative, sequential and deliberate test-bed environment. Testing priorities will be established by each participating nation and co-ordinated by the Host Nation based upon current equipment, national interest and high probability of implemented connectivity. The test planning will allow nations to conduct bilateral interoperability testing prior to the coalition tactical network being constructed. The testing will identify interoperability gaps and either develop workable solutions to achieve interoperability, or enable nations to identify areas for consideration within future procurement or post design enhancement.

d. Analysis and Recording

(1) To document the level of interoperability achieved to date;

(2) To produce a list of "achieved" and "non achieved" interoperability areas to serve as the basis for future CIS interoperability planning to support subsequent ABCA(NZ) demonstrations and CIS interoperability tests;

(3) To document the areas of required future work; and

(4) To prepare a list of QSTAGS to be validated.

- The analysis and recording will establish the quality of data and voice networks in areas such as interoperability, stability and flexibility. It will lead to the creation of a CIS interoperability guide designed for use by the operational planner, the national equipment acquisition staff as well as the equipment operator in the field.
- All activity will emphasise the importance of human interoperability in any operation and to establish human relations and personal contacts among the CIS professionals of the participating nations.
- It is not however the intent to provide a forum for briefings/demonstrations on new technology and equipment in the CIS world beyond what is currently fielded by participating nations.
- Proposed technical objectives for each workshop are provided at Appendix 1.

ORGANIZATION

7. CID BOREALIS 2002 is an ABCA (NZ) directed demonstration consisting of a series of CIS related interoperability planning conferences and a deployed demonstration conducted among participating nations.

8. Governance for the CID is provided by ABCA national Heads of Delegation (HODs) and the National Points of Contact (NPOCs) associated with QWG/CIS. The HODs are responsible for the concept paper, the technical goals and objectives, as well as assuring the planning process and the execution of the exercise under the leadership of the Exercise Director. The HODs are also responsible for appointing the chairpersons for the Workshop.

9. CID Borealis is based on three organisational pillars; Interoperability Engineering Teams (IETs), Host Nation Support and Joint Interoperability Test Command (JITC).

a. Interoperability Engineering Teams (IETs). The IETs are responsible to plan, develop and field the subnetworks and coalition tactical network upon which testing will be conducted. Each nation has designated a National IET Chief who responds to the guidance of the CID Chief IET. To manage the work and provide for broad participation by all nations the division of labour for the IETs has been divided into Workshops that provide a focus for the technical planning and execution of tests. National IET Chiefs are also Workshop Chairpersons. The IETs transition to Workshops when activities transition from planning to deployment.

b. Host Nation Site Support. Site support is established to plan for and provide the infrastructure and logistics support for the Demonstration. This group is responsible for site set-up, administrative communications, billeting, welfare and messing during the workshop and all deployment/redeployment transportation requirements. The group will provide a number of other activities designed to enable and encourage human interoperability.

c. Joint Interoperability Test Command (JITC). JITC brings to CID BOREALIS 2002 the necessary expertise for reliable CIS interoperability testing and documentation support. JITC supports the planning and testing activities the conduct of which remains the responsibility of participating nations. They supervise the test teams who in accordance with the test schedule evaluate equipment interoperability. As a United States Command, JITC takes formal guidance from national US authorities. However for the purposes of CID 2002 JITC will provide services as determined by a pre-arranged agreement. Participating nations will be requested to provide test-leaders and documenters as augmentees to JITC.

PARTICIPANTS

10. Participation in CID BOREALIS 2002 is restricted to ABCA (NZ) nations and those countries and organisations that have been invited to observe/participate:

a. Full participating nations serve as equal partners in determining the concept, the technical goals, objectives and direction of the CID. They participate with CIS material and are limited to the ABCA (NZ) Nations.

b. Observer nations and organisations are invited to observe CID events but do not bring their own equipment to participate in workshop activities. For example national representatives from NATO countries who are invited to attend the CID would be considered as observers.

c. Visitors are the responsibility of the Host Nation Support (HNS) section. For visitors not within ABCA (NZ) every visit must be accepted first by the host nation, secondly by ABCA, and then by all participating nations.

PLANNING PROCESS

11. CID Borealis follows a collaborative planning process in an interactive, team-building environment where representatives from participating nations and organisations design and execute a coalition tactical network upon which interoperability tests are conducted. The planning process is characterised by as an open forum that leads to open discussion and resolution of issues.

12. Deliberate planning is key to the success of CID BOREALSI 2002. Not burdened with constraints resulting from a real operational situation, CID Borealis 2002 will follow a deliberate planning process to establish detailed technical objectives, develop a CIS network architecture to meet those objectives, and design a test plan for execution during the employment phase.

13. A planning cycle takes three years allowing the necessary time to gain approval and funding at the national level for participants, and giving the nations time to deconflict CID BOREALIS 2002 events with other national and international responsibilities. Each year the members of the Planning

Conferences on advice from the CID and Technical Director will establish the focus and technical objectives. Additionally, Planning Conferences prioritise the tests they wish to accomplish in order to make efficient use of the testing time available. This prioritisation should be based on national interests, membership in multinational units, high probability of implementation in exercises/operations, and technological compatibility.

14. The planning cycle includes six major events; five planning conferences and the CID BOREALIS 2002 deployment. These are complimented by smaller engineering planning conferences and technology specific testing opportunities.

PLANNING CONFERENCES

15. The majority of the detailed planning for CID BOREALIS 2002 is conducted during the five planning conferences. A planning conference could be preceded by a pre-meeting designed to get the national leaders (i.e., CID Coord, Chief IET, Chief Support, workshop chairpersons, deputy chairpersons, and support staff) together to prepare for the conference activities scheduled for the following week .The conferences are spaced throughout the planning years to minimise the impact CID BOREALIS 2002 activities could have on the internal business of the nations participating in the program. Additionally, this format provides time to refine and reflect on the work and accomplishments of the past conferences and prepare for the next. All participating nations are encouraged to host the planning conferences.

16. The conduct for CID Borealis has been divided into five phases: Design, Development, Pre-Deployment, Employment and Analysis.

PHASE 1 - DESIGN

17. The Design Phase established the general concept for the CID. The co-ordination of foundational information ensured a successful planning cycle and sets the stage for productive planning conferences to follow. High Level Guidance deliverables include the Exercise Directive, CID objectives (technical and otherwise), testing priorities and an outline-planning organisation. Design reviews were conducted between nations to provide baseline information on system interoperability and equipment configuration. From this courses of action were developed and resourced for the remaining phases. Nations also submitted their first estimate of the number of personnel and types of equipment that will be deployed.

PHASE 2 - DEVELOPMENT

18. During this crucial phase the technical priorities approved by the HODs are implemented in the form of a draft network architecture and draft test plan. The technical characteristics of the equipment are collected. This data will be used to plan the testing to be conducted during the deployment phase and for inclusion in interoperability documents. A draft Support Plan is written.

19. The HODs review and approve the network architectures and fine tune the planning and exercise organisational structures as necessary. Nations also submit updated estimates of the number of

personnel and types of equipment to be deployed. Pre testing of specific equipment is conducted as deemed necessary to decrease risk during the employment phase.

20. During Planning Conference 4 (PC 4) the subnetwork and network architectures, test plans and support plans are briefed and a first draft of the test schedule is published. Transportation planning is conducted to move required equipment to the workshops. The HODs review the CID Concept Paper and discuss potential technical objectives for the following year's exercise. Nations also finalise their personnel and equipment numbers.

21. PC 5 marks the end of the Development Phase and the transition to the Employment Phase. At PC 5 a final review of the network architecture, test plan and workshop schedule are conducted. Transportation and logistics plans are finalised and the Support Plan is distributed and reviewed.

PHASE 3 - PRE DEPLOYMENT

22. The Pre Deployment phase provides an opportunity to review the quality of the plans. This is done through activities identified during the courses of action discussions held during the design phase. Currently two pre–deployment activities are planned; the first is a visit to Exercise Combined Endeavor 2002; the second is a review of CID Borealis plans with national signal unit leadership immediately prior to start-ex.

PHASE 4 - EMPLOYMENT

23. The employment phase will be conducted in four stages:

a. Stage One will see the national contingents arrive in Kingston, deploy, set-up, power up and internally prove their national CIS systems. Opening ceremonies will be conducted. During this time Workshop Chairpersons will be organising the conduct of their workshops. Training will be conducted for network managers and test team evaluators.

b. Stage Two will focus on achieving interoperability within technology specific workshops on a bilateral and multilateral basis in accordance with the test plan. Workshop will run an activity wherein similar technologies are interconnected and the point-to-point, bilateral aspects of the test plan are conducted. Through this activity sub-networks of the coalition tactical network will be proven. When a basic level of interoperability and stability within the workshops have been established the Workshops will assist the Network Management organisation with the construction of the coalition tactical network that had been planned during the prior planning conferences. Network management processes will be refined during Stage Two.

c. Stage Three will focus on building the coalition tactical network that had been designed during the planning process. This will entail the progressive layering of individual sub-networks to form a coalition tactical network consisting of switch, router, radio and application technologies that provide voice, data, transmission and information exchange services. Once the coalition tactical network has been established its quality in terms of interoperability will be assessed under the direction of the Network Management Workshop

and in accordance with the latter stages of the test plan. Throughout Stage Two and Three Test Team Evaluators will be meeting with Workshop members and national representatives to conduct tests, record results and where possible assist with problem solving.

d. Stage Four includes closing ceremonies, take down of equipment and departure of national delegations.

PHASE 5 - ANALYSIS

24. Interoperability is but one characteristic of several that needs to be considered when analysing the quality of a network. Other characteristics include flexibility, responsiveness, availability, redundancy, reliability, stability, mobility, discipline and sustainment. The technical interoperability test results to be gathered by JITC will be analysed to provide quantitative insight into the interoperability characteristics of ABCA (NZ) CIS. During this process it will be possible for JITC and CID staff to make a qualitative assessment of CIS availability, reliability, redundancy and stability. Characteristics such as responsiveness, redundancy, mobility, discipline and sustainment will be research objectives for the operational analysis to be conducted by QWG OR/SWP EPA.

WORKSHOP

25. During the planning phase, Workshops (WS) have been established to facilitate technical planning and the execution of testing. These WS are technology-centric or process-centric depending on the recommendations of the CID Coord/Chief IET and the decisions of the HODs. The current workshops are:

Technology centric	Process Centric
VHF – NZ HF – CA LAN/WAN– AS Switch – CA IS – US	Network Management – CA Testing Plan – Joint Interoperability Test Command (JITC) EW/SigInt Support - CA

26. Within the CID, the Workshops form the ‘technical’ chain of command. The Workshops are composed of subject matter experts from the participating nations. They are responsible for developing the technical network architecture and test plan. A Chairperson who could be a National IET Chief or national representative to the QWG/CIS Special Working Parting CIS Interoperability Engineering (SWP/CIE) will lead each WS. WSs will be asked to designate a Deputy Chairperson. Representatives from the Joint Interoperability Test Command will assist the WS. Each Workshop Chairman is a member of the Network Management Workshop as are representatives from JITC and national delegations.

27. The Network Management Workshop is responsible for participating in the planning and co-ordination with the different Workshops to achieving national objectives, workshop objectives and test objectives. During the deployment phase they are in charge of co-ordinating and facilitating the building of the tactical networks and the execution of the test plan with the National Delegations, JITC and Workshop Chairpersons.

28. During the Design Phase QWG/CIS has canvassed other QWGs to assess their interest in participating in CID Borealis. QWG/EW-SigInt Support (EW/SS) expressed interest to participate primarily as a parallel process centric workshop to test EW sensor interoperability in connectivity, data collection and data display. In addition, QWG Engineers has expressed interest for their Field Support Special Working Party (Topo Fd Sp SWP) to participate to test data transfer capabilities.

PRODUCTS

29. Thorough documentation of the interoperability testing conducted during CID is essential. The data provides CIS planners with important information needed to plan future CIS architectures. The documentation of the tests provides the baseline for future testing. The following list is representative of the products that will be produced during an annual CID.

a. ABCA CIS Interoperability Guide. This guide, produced under agreement with JITC, provides detailed information on the results of the interoperability testing and data exchange conducted during the workshops. The data will be a resource to use in the development of CIS architectures during workshops and real-world operations. The CIS Interoperability Guide is produced by JITC in a web compatible version on CD-ROM. A hard copy of the CIS Interoperability Guide will be provided to delegations. In order to have a useable guide, the nations should thoroughly verify the data and update them when necessary.

b. Operational Analysis Report. This report, produced by SWP Exercise Planning and Analysis (EPA) assisted by JITC, provides a senior level overview of the CID. It includes the results of the exercise and their operational impact on Coalition Operations.

c. Employment Plan. This plan, produced during the planning conferences by the WS under the supervision of the Chief of IET and published by JITC, provides detailed information on the conduct of the Employment Phase and associated testing. It outlines the workshop organisational structure and testing schedule.

d. Support Plan. This plan provides detailed support information and logistics requirements associated with the CID. It is produced and published by the Host Nation under the supervision of Chief of Host Nation Support.

e. After Action Report. The AAR reviews the year's activities and has embedded lessons learned. It is produced by the ABCA (NZ) office in Washington.

f. Minutes. These documents, produced by ABCA (NZ) office of the Host Nation, are written and forwarded to participants after each conference and reflect items discussed and approved by the HODs. The minutes are reviewed and approved at the next conference or workshop.

g. CID BOREALIS 2002 Web Site. This public/private-accessible web page provides non-sensitive information about CID BOREALIS 2002 as well as historical data and information about upcoming events. Canada currently hosts the site. It becomes an information management tool during the Deployment Phase of CID BOREALIS 2002.

FUNDING

30. Funding for CID BOREALIS 2002 comes from multiple sources that are determined by the ABCA (NZ) program and by national authorities.

FUTURE DIRECTIONS

31. ABCA will focus on achieving and sustaining CIS interoperability among the participants by continuing to sponsor conferences, workshops and demonstration. The primary focus of CIS interoperability testing will be network oriented, including any communications subsystems that interface or interconnect with the network. Testing may be expanded to focus more extensively on IS and the associated staff processes.